IN THE CLAIMS

1. (Currently Amended) A phantom for MR applications evaluation comprising:

a structure constructed to support a plurality of sections, wherein the structure includes a grid defining a plurality of multi-layer cells, and wherein each section is supported by at least two cell layers;

a first section containing material to emulate the MR properties of white matter of a human brain;

a second section containing material to emulate the MR properties of gray matter of a human brain; and

wherein the MR properties of the first and second sections differ in proton density.

2. (Original) The phantom of claim 1 wherein each section contains paramagnetic salt and agarose gel for T1 and T2 control.

3. (Original) The phantom of claim 2 wherein the first section further comprises a plurality of tubes wherein each tube contains a common composition of paramagnetic gel, agarose gel, deuterium oxide, and water.

4. (Original) The phantom of claim 3 wherein the common composition includes approximately:

1.5 millimolar nickel(II) chloride paramagnetic salt;

1 percent by weight agarose gel;

35 percent by volume deuterium oxide;

65 percent by volume water; and

0.1% potassium sorbate.

5. (Original) The phantom of claim 2 wherein the second section further comprises a plurality of tubes wherein each tube contains a common composition of paramagnetic salt, agarose gel, deuterium oxide, and water.

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6. (Original) The phantom of claim 5 wherein the common composition includes approximately:

0.9 millimolar nickel(II) chloride paramagnetic salt;

1 percent by weight agarose gel;

20 percent by volume deuterium oxide;

80 percent by volume water; and

0.1% potassium sorbate.

7. (Currently Amended) The phantom of claim 1 wherein the first and second sections contain deuterium oxide and wherein the amount of deuterium oxide in each section is set to a level to optimize flip angle in T1-weighted sequences for human scanning.

8. (Original) A method of manufacturing a phantom for MR evaluation comprising the steps of:

constructing a base having a number of interstitial cavities;

depositing a first combination of paramagnetic powder, agarose powder, deuterium oxide, and water in a first set of interstitial cavities; and

depositing a second combination of paramagnetic powder, agarose powder, deuterium oxide, and water in a second set of interstitial cavities.

9. (Original) The method of claim 8 further comprising providing a plurality of tubes to receive the first and second combinations therein, respectively, and to be located in the interstitial cavities.

10. (Original) The method of claim 9 further comprising the step of depositing the first combination and the second combination such that the paramagnetic powder and the agarose powder mix with the water to form a paramagnetic gel and an agarose gel in each tube, respectively.

11. (Original) The method of claim 9 wherein the first combination includes approximately 65 percent by volume water, and approximately 35 percent by volume deuterium oxide and the second combination includes approximately 80 percent by volume water, and approximately 20 percent by volume deuterium oxide.

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12. (Original) The method of claim 9 further comprising the step of removably sealing an open end of each tube.

13. (Original) The method of claim 9 further comprising the step of placing the tubes in the interstitial cavities such that each tube of the first set of tubes is at least adjacent to at least one other tube of the first set and that each tube of the second set of tubes is at least adjacent to at least one other tube of the second set.

14. (Original) The method of claim 13 wherein the first set of tubes emulates MR characteristics of white brain matter of a human brain and the second set of tubes emulates MR characteristics of gray matter of a human brain.

15. (Original) The method of claim 8 further comprising providing a plurality of rails to form the interstitial cavities

16. (Currently Amended) A method of evaluating MR applications comprising the steps of:

(A) placing a phantom in a relatively homogeneous magnetic field, B0, wherein the phantom includes at least [[a]] material to mimic proton density differences between a first tissue and a second tissue;

(B) applying a T1-weighted sequence to acquire T1-weighted MR data of the phantom; and

(C) determining an optimum flip angle for T1-weighted imaging of a human brain having characteristics similar to that of the phantom when subjected to B0.

17. (Original) The method of claim 16 further comprising the step of repeating steps (B) through (C), and applying another T1-weighted sequence different to that applied at step (B).

18. (Original) The method of claim 16 wherein an optimum flip angle is determined to be less than 90 degrees.

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19. (Original) The method of claim 16 wherein the material includes deuterium oxide.

20. (Original) The method of claim 19 wherein the phantom further includes paramagnetic gel, agarose gel, and water.

21. (Original) The method of claim 20 wherein the first tissue corresponds to white matter in a human brain and includes 65 percent by volume water, 1.532 millimoles of $NiCl_2$, 1.09 percent by weight agarose gel, and 35 percent by volume deuterium oxide, and the second tissue corresponds to gray matter in a human brain and includes 80 percent by volume water, 0.904 millimoles of $NiCl_2$, 0.95 percent by weight agarose gel, and 20 percent by volume deuterium oxide.

22. (Original) The method of claim 16 further comprising the step of reconstructing at least one image of the phantom, reviewing the at least one image for contrast, adjusting flip angle of the T1-weighted sequence, and reacquiring data for reconstruction of another at least one image.

23. (Original) A kit to form a human brain phantom for MR imaging applications comprising:

a plurality of receptacles;

a system having a plurality of cells wherein each cell is constructed to receive a receptacle;

a first mixture comprising paramagnetic material, agarose material, and deuterium oxide; and

a second mixture comprising paramagnetic material, agarose material, and deuterium oxide; and

wherein the first mixture has a proton density substantially equivalent to human brain white matter, and the second mixture has a proton density substantially equivalent to human brain gray matter.

24. (Original) The kit of claim 23 wherein each receptacle further comprises a re-sealable tube.

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25. (Original) The kit of claim 23 further comprising a third mixture that includes material to mimic cerebral spinal fluid (CSF) in a human brain.

26. (New) A phantom for MR applications evaluation comprising:

a structure constructed to support a plurality of sections;

a first section containing material to emulate the MR properties of white matter of a human brain;

a second section containing material to emulate the MR properties of gray matter of a human brain;

wherein the MR properties of the first and second sections differ in proton density;

wherein each section contains paramagnetic salt and agarose gel for T1 and T2 control;

wherein the first section further comprises a plurality of tubes wherein each tube contains a common composition of paramagnetic gel, agarose gel, deuterium oxide, and water; and

wherein the common composition includes approximately:

1.5 millimolar nickel(II) chloride paramagnetic salt;

1 percent by weight agarose gel;

35 percent by volume deuterium oxide;

65 percent by volume water; and

0.1% potassium sorbate.

27. (New) A phantom for MR applications evaluation comprising:

a structure constructed to support a plurality of sections;

a first section containing material to emulate the MR properties of white matter of a human brain;

a second section containing material to emulate the MR properties of gray matter of a human brain;

wherein the MR properties of the first and second sections differ in proton density;

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wherein each section contains paramagnetic salt and agarose gel for T1 and T2 control;

wherein the second section further comprises a plurality of tubes wherein each tube contains a common composition of paramagnetic salt, agarose gel, deuterium oxide, and water; and

wherein the common composition includes approximately:

0.9 millimolar nickel(II) chloride paramagnetic salt;

1 percent by weight agarose gel;

20 percent by volume deuterium oxide;

80 percent by volume water; and

0.1% potassium sorbate.